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10/523,623

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Alain Bergel

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EXAMINER

ESSEX, STEPHAN J

ART UNIT

PAPER NUMBER

1727

MAIL DATE

DELIVERY MODE

02/15/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/523,623 | Applicant(s) BERGEL ET AL. | |
| | Examiner STEPHAN ESSEX | Art Unit 1727 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The applicant's arguments filed on December 6, 2010 were received.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

3. The rejection of claims 1-3, 5 and 6 under 35 U.S.C. 102(b) as being anticipated by Zeikus et al. (hereinafter "Zeikus") (U.S. Pat. No. 6,270,649) is maintained.

Regarding claims 1 and 5, Zeikus teaches a method of using neutral red and cells or enzymes to produce electricity comprising the steps of (a) providing an electrochemical bioreactor system (fuel cell) having a cathode compartment equipped with a cathode and an anode compartment equipped with an anode, the cathode and anode compartments being separated by a cation selective membrane; and (b) placing a suitable amount of neutral red and a biological catalyst (biofilm) in the cathode compartment (medium capable of causing the growth of biofilms). To maximize the interconversion of biochemical and electrical energy, the biological catalyst is immobilized (formed) on the cathode. The method of the invention further comprises the step of delivering to the cathode an electric current suitable in strength to cause the reduction of at least a portion of oxidized neutral red in the cathode compartment (bias potential) (see col. 5, lines 55-56; col. 6, lines 35-57; figure 1).

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Regarding claims 2 and 3, Zeikus teaches that the cathode compartment is filled with a catholyte material (medium capable of causing growth of the biofilm) such as a phosphate buffer comprising saline (seawater) (see col. 8, lines 35-48).

Regarding claim 6, Zeikus teaches that reduction of neutral red requires a potential (polarization potential) $E_o' = -0.325$ volts.

Claim Rejections - 35 USC § 103

4. The rejection of claim 4 under 35 U.S.C. 103(a) as being unpatentable over Zeikus as applied to claims 1-3, 5-8 and 18 above, and further in view of Chaix (WO02/0058221A1; see U.S. Pat. No. 7,122,273 for English translation) is maintained.

Regarding claim 4, Zeikus is silent to the water being circulating water.

Chaix teaches a fuel cell with electrodes immersed in water, wherein the water is circulating water (col. 5, lines 4-9). It would have been obvious to one of ordinary skill in the art to modify the fuel cell of Zeikus with the circulating water of Chaix because the circulating water allows for effective cooling of the fuel cell (see Chaix, col. 4, lines 48-51).

Response to Arguments

5. Applicant's arguments filed December 6, 2010 have been fully considered but they are not persuasive.

Applicant's principle arguments are as follows:

A) *Zeikus fails to teach forming a biofilm on at least part of the surface of said electrode and simultaneously subjecting said electrode to a bias potential before said electrode is placed in said cell. Zeikus describes process and activity after the microbial fuel cell is assembled (i.e. after an electrode is placed in the microbial fuel cell).*

B) *Applicant's invention makes it possible to limit, or even to completely replace, the charging with mineral catalysts of the electrodes by forming the biofilm for catalyzing the electrode reactions. The formation of the biofilm also makes it possible to limit or even to completely replace the materials normally used to make the cathode, such as graphite and platinum, with less expensive materials, such as stainless steels and aluminum, nickel or titanium alloys.*

6. In response to Applicant's arguments, please consider the following comments:

A) In describing a process which take place after the microbial fuel cell is assembled, Zeikus teaches performing the process steps of Applicant's invention in an order which differs from that of Applicant's Claim 1. However, the Courts have held that the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. See *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946).

B) In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., replacing charging of the electrodes with mineral catalysts, limiting or replacing the materials normally used to make the cathode) are not recited in the rejected claim(s).

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Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHAN ESSEX whose telephone number is (571) 270-7866. The examiner can normally be reached on Monday - Friday, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SJE

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1727